

**REPORT OF JURISDICTIONAL WATERS
ASSESSMENT AND DETERMINATION**

**PROPOSED GREENSBORO NORTHERN AND EASTERN LOOP
T.I.P. NUMBERS U-2525 B AND C
GUILFORD COUNTY, NORTH CAROLINA**

Prepared For:

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1.0 INTRODUCTION

The following Waters of the United States Summary Report is submitted to assist in permitting for impacts associated with the proposed U-2525B and U-2525C roadway project. The project is situated along the northeastern portion of the Greensboro City Limits in Guilford County, North Carolina.

1.1 Project Description

The project area consists of an approximately 13-mile, 1,000-foot wide study corridor that encompasses approximately 1,772 acres. The project area is aligned along the northeastern portion of the Greensboro City Limits and is slated for roadway development. The project originates at the terminus of the future I-840 at Burlington Road (US-70), and ends northwesterly just east of Lawndale Drive (Figure 1). The project area is predominantly undeveloped or wooded, with industrial and residential development interspersed and concentrated along existing roads.

1.2 Purpose

The purpose of this technical report is to inventory, catalog, and describe the various Waters of the United States (streams and wetlands) likely to be impacted by the proposed action; and to identify potential development constraints within the project area. A previous delineation of wetlands was conducted by North Carolina Department of Transportation (NCDOT) biologists within a 300-foot corridor of the proposed U-2525, Section B in December 2003 and January 2004. Stream channels and surface water impoundments (ponds, etc.) within the 1,000-foot corridor of U-2525, Sections B and C were previously surveyed by the NCDOT Location and Surveys (L&S) Unit.

MACTEC identified and delineated those jurisdictional wetlands within a 1,000-foot corridor of the proposed U-2525 Section B and C that had not been identified and delineated during the preliminary survey conducted by NCDOT. MACTEC classified and delineated jurisdictional streams that had not been surveyed by NCDOT L&S. In addition, MACTEC classified jurisdictional streams previously located by NCDOT L&S as either intermittent or perennial. For the purposes of this study, man-made ditches and drainage channels less than 50 linear feet in length were not classified.

1.3 Methodology

Preliminary research was conducted using a Geographic Information System (GIS) prior to field investigations. GIS information sources used in this pre-field investigation of the study area include: U.S. Geological Survey (USGS) 7.5 minute quadrangle mosaic of Guilford County, U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) layer, USDA Natural Resources Conservation Service (NRCS) *Soil Survey of Guilford County, North Carolina* (1977), and City of Greensboro 2002 aerial photo-mosaic of Guilford County. Water resource GIS layers utilized included USGS streams, unnamed tributaries, City of Greensboro stream classification layer, named waterbodies (lakes, reservoirs) and unnamed waterbodies

(ponds, small lakes). Computer-Aided Drafting (CAD) files of the U-2525B&C roadway corridor, and previous NCDOT stream and wetland delineations were provided by NCDOT.

GIS field maps were generated depicting the U-2525B&C 1,000-foot corridor alignment, Guilford County roads, USGS hydrography, NRCS hydric soils, NWI wetlands, and previous NCDOT stream and wetland delineations overlain on 2002 aerial photography provided by Guilford County GIS.

MACTEC environmental scientists Kevin Nunnery, Jim Cutler, Amin Davis, Joshua Ellinger, Danielle Mora, Ronald Spears, and Lisa Thatcher conducted field surveys along the proposed U-2525B&C alignment during the period from 9 May 2005 to 22 May 2005. A global positioning system (GPS) unit was used to locate jurisdictional areas that had previously been identified by NCDOT to minimize duplication of effort. Jurisdictional wetland determinations were performed utilizing delineation criteria prescribed in the United States Army Corps of Engineers' (USACE) *Wetlands Delineation Manual* (Department of the Army, 1987). The wetland areas identified were described in accordance with N.C. Division of Water Quality's (NCDWQ) *Field Guide to NC Wetlands* and USFWS *Wetlands and Deepwater Habitats Classifications* (Cowardin et. al, 1979).

Streams were classified using guidance provided by NCDWQ *Identification Methods for the Origins of Intermittent and Perennial Streams* (2005). Streams that were assessed by MACTEC were classified as either intermittent or perennial. Streams that were previously classified by MACTEC for the City of Greensboro in 2001 were not assessed in the field. However, intermittent and perennial breakpoints from this previous study were mapped and included as a supplement to the stream classifications conducted within the U-2525 C corridor (Mactec,2001). For the purposes of this study, ephemeral-only channels encountered in the field that did not exhibit intermittent or perennial features were noted on NCDWQ Stream Identification Forms but not scored according to the NCDWQ stream classification method. Streams that were mapped by USGS as third order or greater were not scored according to the NCDWQ stream classification method since these streams are always considered to be perennial per NCDWQ guidance (2005). Twelve additional streams that were previously located by NCDOT L&S were not scored and received a notation of "N/A". Please see Table 3 in Appendices for a summary and explanation of stream classifications.

MACTEC prepared a USACE *Wetland Data Form* for each wetland area identified as well as a *Wetland Data Form* for each corresponding upland area. A NCDWQ *Wetland Rating Form* was also prepared for each wetland area identified. MACTEC flagged the approximate boundaries of jurisdictional wetland areas and recorded these locations using a GPS unit capable of differentially-correcting data to sub-meter accuracy. MACTEC completed NCDWQ *Stream Identification Forms* to classify stream channels that had been previously surveyed by NCDOT within the U-2525 B&C study corridor. MACTEC placing colored flagging at intermittent and perennial stream breakpoints and along the banks of jurisdictional stream channels that had not been previously surveyed by NCDOT. These locations were also recorded using a GPS capable of sub-meter accuracy. Please refer to Appendices for copies of wetland and stream data forms.

GPS data points were differentially corrected to sub-meter accuracy and imported into a CAD program. Linear features depicting jurisdictional stream channels and polygons depicting jurisdictional wetland areas were digitized from the corrected GPS points and exported as a *drawing exchange file* (.dxf). The .dxf file was then converted to a *MicroStation design file* (.dgn) with text annotation of stream/wetland identification labels and approximate sizes in linear feet (streams) and acres (wetlands) of each jurisdictional feature. Intermittent and perennial stream breakpoints were also exported into a .dgn file. Please refer to Table 1 for metadata related to CAD, GIS and GPS methodology.

1.4 Qualifications of Investigators

Investigator: **Kevin Nunnery, CPSCC, PhD, Principal Natural Resources Scientist**
MACTEC Engineering & Consulting, Inc. December 2004 to June 2005
Education: Doctor of Philosophy, Wetland Ecology/Restoration Ecology, Duke University, 1997
Master of Science, Restoration Ecology, North Carolina State University, 1993
Bachelor of Science, Forestry, North Carolina State University, 1991
Prior Experience: RK&K Engineers, 2001 to 2004
KCI Technologies, 1999 to 2001
Triangle Wetland Consultants/Greenvest, 1998 to 1999

Investigator: **Jim Cutler, Project Natural Scientist**
MACTEC Engineering & Consulting, Inc. May 2005 to Present
Education: Master of Science, Wildlife Ecology, Mississippi State University, 1986
Bachelor of Science, University of Georgia, 1979, Forest Resources
Prior Experience: Senior Wetlands Scientist, Froehling & Robertson, Inc., Charlotte, North Carolina. July 2004 to May 2005
Senior Scientist, Breedlove, Dennis & Associates, Inc. (BDA), Winter Park, Florida, April 1998 to July 2004.
Project Biologist, Dames & Moore, Orlando, Florida, January 1995 to March 1998
Senior Scientist, Canin Associates, Inc., Orlando, Florida. September 1993 to December 1994
Associate Scientist II, BDA, Winter Park, Florida. April 1987 to August 1993

Investigator: **Ronald Spears, Project Natural Scientist**
MACTEC Engineering & Consulting, Inc. April 2005 to Present
Education: Master of Science, Biology/Wildlife Management, Georgia Southern University 1995
Bachelor of Science, Biology/Pre-Med, LaGrange College 1992
Prior Experience: Senior Scientist, Environmental Services, May 2000 to April 2005
Outreach Coordinator, Wildlife Specialist, Georgia Department of Natural Resources, March 1998 to May 2000

Agriculture Pesticide Inspector, Georgia Department of Agriculture,
October 1996 to March 1998
Science Teacher, Jenkins County High School, Millen, Georgia,
September 1995 to September 1996
Research Assistant, Southern University, Department of Biology, August
1993 to August 1995

Investigator: **Amin Davis, Project Natural Scientist**
MACTEC Engineering & Consulting, Inc., August 2004 to Present
Education: Master of Zoology, North Carolina State University, 1997
Bachelor of Science, Marine and Environmental Science, Hampton
University, 1995
Prior Experience: Staff Scientist, The Louis Berger Group, Inc., October 2002 to May 2004
Staff Scientist, Arcadis G&M, Inc., October 1999 to August 2002

Investigator: **Josh Ellinger, Project Natural Scientist**
MACTEC Engineering & Consulting, Inc. May 2003 to Present
Education: Bachelor of Biology – Ecology, Bridgewater College, 2002
Prior Experience: Fisheries Technician, Virginia Department of Game and Inland Fisheries,
September 1999 to October 2002
Collection Officer, USDA Forest Service, June 1999 to September 1999
Industrial Support and Production Specialist, WNI Industrial Services,
May 1997 to September 1997

Investigator: **Danielle Mora, Staff Environmental Scientist**
MACTEC Engineering & Consulting, Inc. September 2004 to Present
Education: Bachelor of Science, Environmental Science, Catawba College, 2004
Prior Experience: MACTEC Engineering & Consulting, Inc. September 2004 to Present

Investigator: **Lisa Thatcher, EIT, Staff Environmental Engineer**
MACTEC Engineering & Consulting, Inc., November 2004 to Present
Education: Master of Science, Marine Science, University of North Carolina-
Wilmington, 2005
Bachelor of Science, Biological Engineering, North Carolina State
University, 2000
Prior Experience: Aquatic Ecology Research Assistant, University of North Carolina-
Wilmington, 2004
Wetlands Ecology Research Assistant, University of North Carolina-
Wilmington, 2002-2003
Associate Project Engineer, Underwriters Laboratories, 2000-2001

1.5 Definitions

Definitions for area descriptions used in this report are as follows: **Project Study Area** denotes the area bounded by proposed construction limits; **Project Vicinity** describes an area extending 0.50 mi on all sides of the project study area; and **Project Region** is equivalent to an area

represented by a 7.5 minute USGS quadrangle map with the project occupying the central position.

2.0 JURISDICTIONAL TOPICS

This section provides descriptions, inventories, and impact analysis pertinent to “Waters of the United States”.

2.1 Waters of the United States

Surface waters and jurisdictional wetlands fall under the broader category of "Waters of the United States" as defined in 22 CFR Part 328.3. Any action that proposes to dredge or place fill material into surface waters or adjacent wetlands falls under the jurisdiction of the USACE under Section 404 of the Clean Water Act (33 USC 1344). Surface waters include all standing or flowing waters that have commercial or recreational value to the public. Wetlands are identified based on the presence of hydric soils, hydrophytic vegetation, and saturated or flooded conditions during all or part of the growing season.

2.1.1 Impacts to Wetlands and Surface Waters

Potential wetland communities were investigated pursuant to the 1987 Corps of Engineers *Wetlands Delineation Manual*. The three-parameter approach is used where hydric soils, hydrophytic vegetation, and prescribed hydrologic characteristics must all be present for an area to be considered a wetland.

NCDOT biologists conducted delineations of jurisdictional wetland areas within a 300-foot corridor of the proposed U-2525, Section B in December 2003 and January 2004. NCDOT delineated a total of 28 wetland areas in Section B encompassing approximately 6.95 acres. Approximately 5.99 acres of this total wetland area were classified as “Palustrine, Forested, Broad-Leaved Deciduous” (PFO1) and 0.96 acres were classified as “Palustrine, Emergent, Persistent” (PEM1) according to Cowardin et al, (1979). A total of approximately 8.34 acres of surface water impoundments were delineated by NCDOT L&S.

MACTEC scientists conducted delineations of jurisdictional wetland areas within a 1,000-foot corridor of the proposed U-2525, Sections B and C in May 2005 (Figure 2 and 3). MACTEC delineated a total of sixty wetland areas encompassing approximately 22.94 acres within the corridor boundary. Approximately 22.26 acres of this total wetland area were classified as PFO1 and 0.69 acres were classified as “Palustrine, Open Water/Unknown Bottom” (POW) according to Cowardin et al, (1979). Please see Tables 1 and 2 in Section 4.1 of the Appendices for a listing of jurisdictional wetlands identified by NCDOT & MACTEC.

NCDOT L&S located and surveyed stream channels within a 1,000-foot corridor of the proposed U-2525, Sections B and C. NCDOT L&S located a total of approximately 100 stream channels encompassing approximately 67,669 linear feet within the corridor. MACTEC classified stream channels that had been previously located by NCDOT L&S. Please see Tables 3 and 4 in Section 4.1 of the Appendices for a complete summary of stream classifications.

MACTEC classified and delineated approximately 5,807 linear feet of jurisdictional stream channels that had not been located by NCDOT L&S within the 1,000-foot corridor (Figures 3, 4, and 5). Approximately 3,487 linear feet of these streams were classified as intermittent at their origin within the corridor and approximately 2,320 linear feet of these streams were classified as perennial at their origin within the corridor. Project construction will not require the entire 1,000-ft corridor; therefore actual surface water and wetland impacts will be considerably less than the total encountered in the project study area. Please see Appendices A and B for copies of wetland and stream data forms.

2.1.2 Permits

As described above, impacts to jurisdictional surface waters and wetlands are anticipated from the proposed project. As a result, construction activities will require permits and certifications from various regulatory agencies charged with protecting the water quality of public water resources. Section 404 of the Clean Water Act (33 USC 1344) requires authorization from the Secretary of the Army, acting through the USACE, for the discharge of dredged or fill material into all waters of the United States, including wetlands. The USACE issues permits for activities that cannot avoid impacting streams or wetlands with the requirement that adverse environmental effects will be minimized to the extent practicable.

In North Carolina, the Wilmington District of the USACE has jurisdiction over any activities that may impact streams and wetlands. A determination is made regarding whether a permit will be issued, the type of permit issued, and the requirements attached to the permit based upon the extent of the impacts and the specific environment impacted. Given the anticipated impacts to streams and wetlands, and Individual Permit will likely be required for the proposed project.

Section 401 of the Clean Water Act delegates NCDWQ to issue a 401 Water Quality Certification for all projects that require a Federal Permit. Section 401 of the Clean Water Act requires that the state issue or deny water quality certification for any federally permitted or licensed activity that may result in a discharge to "Waters of the United States." The USACE will determine whether a permit is required, the type of permit required, and the specific conditions attached to the permit based upon the extent of impacts and the environment impacted. Compliance with the general provisions of the City of Greensboro Water Supply Watershed regulations may also be necessary for a portion of this project. Given the anticipated impacts to streams and wetlands, an Individual Permit will likely be required for the proposed project.

2.1.3 Mitigation

The USACE has adopted, through the Council on Environmental Quality (CEQ), a wetland mitigation policy which embraces the concept of "no net loss of wetlands" and sequencing. The purpose of this policy is to restore and maintain the chemical, biological, and physical integrity of "Waters of the United States," specifically wetlands. Mitigation of wetland and stream impacts has been defined by the CEQ to include avoiding impacts, minimizing impacts, rectifying impacts, reducing impacts over time, and compensating for impacts (40 CFR 1508.20).

Each of these three aspects (avoidance, minimization, and compensatory mitigation) must be considered sequentially.

2.1.3.1 Avoidance

Avoidance examines all appropriate and practicable possibilities of averting impacts to “Waters of the United States.” During the roadway design phase of this project, every practicable effort will be made to avoid conflicts of the roadway alignment with jurisdictional waters. Where it is not practicable to avoid these conflicts, efforts will be made to minimize impacts of the roadway upon the jurisdictional waters. Given that the proposed project is a highway facility on new location, avoiding all wetlands and stream crossings is not practicable.

2.1.3.2 Minimization

Minimization includes the examination of appropriate and practicable steps to reduce the adverse impacts to “Waters of the United States.” Implementation of these steps will be required through project modifications and permit conditions. Minimization typically focuses on decreasing the footprint of the proposed project through the reduction of median widths, ROW widths, fill slopes, and/or road shoulder widths. Where roadway alignment crosses jurisdictional waters, the utilization of structures such as bridges and bottomless culverts to minimize the impact upon those waters will be investigated.

2.1.3.3 Compensatory Mitigation

Compensatory mitigation is not normally considered until anticipated impacts to “Waters of the United States” have been avoided and minimized to the maximum extent practicable. It is recognized that "no net loss of wetlands" functions and values may not be achieved in each and every permit action. Appropriate and practicable compensatory mitigation is required for unavoidable adverse impacts that remain after all appropriate and practicable minimization has been performed. Compensatory actions often include restoration, creation, and enhancement of “Waters of the United States.” Such actions should be undertaken in areas adjacent to or contiguous to the discharge site whenever possible.

3.0 REFERENCES

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